

December 11th 2023
Castricum, The Netherlands
Newsletter 2023-Q4

Dear readers,

With this newsletter we like to inform you about our day to day business, current projects, performance characteristics of our products and new product development. Enjoy reading!

Day to day business



About 3 year ago we started with the sales of our **soil Redox probes** and **reference electrodes**. We are very proud that the first **scientific articles**, in which our probes are mentioned, are starting to appear.

Scaccia (2023)¹, for example, used our soil Redox probes to study **carbon delivery to floodplain aquifers** in response to water table fluctuations (e.g., due to changes in nearby surface water levels, precipitation, floods, and groundwater pumping). In column experiments, Scaccia (2023) observed that during initial water table fluctuations, redox potential near the soil-mineral interface was relatively stable, but declined after subsequent wettings. This influenced carbon mineralization.

Please contact us at info@swapinstruments.com, if you are interested in information about scientific studies in which our probes are used.

In addition, Machado-Silva *et al.* (2023)² studied **groundwater redox dynamics across the terrestrial-aquatic interface** of Lake Erie coastal ecosystems with our soil Redox probes. They concluded, amongst others, that short-term fluctuations in water table levels significantly impacted the redox potential of groundwater when dissolved oxygen increased.

¹ [content \(osu.edu\)](https://content.osu.edu)

² <https://doi.org/10.1101/2023.06.12.544684>

We are looking forward to all the **other scientific studies** that will be published about **redox dynamics** in the **environment**.

SWAPlog-1



In 2023, we started with the development of a **dedicated datalogger** – called **SWAPlog1** - for registration, recording and readout of a **SWAP instruments probe**. It is powered by internal rechargeable batteries. These are charged by an **integrated solar panel**. Fully charged, the logger works for at least 3 months without needing to be recharged in between. The **entire IP68 waterproof enclosure** can be connected to a probe with an IP68 screw connection. The datalogger powers the probe and communicates using the **SDI-12 protocol**. Wireless data communication and configuration is performed with a **dedicated Android app**. All available and measured data (probe channels, temperature, time and date stamp) are stored in the **embedded non-volatile memory**. The SWAPlog1 can be used both indoors (e.g., laboratory) and outdoors.

Launch of the SWAPlog-1 is foreseen for Q1 2024.

New ORP-30-1-B (8 mm probe)



The **ORP-30-1-B soil Redox probe** is one of our **best-selling** standard soil Redox probes. It has the following **specifications**:

- ✓ 1 x Redox electrode (99.99 % Pt): at 30 cm from probe top side
- ✓ Analog output (mV ORP)
- ✓ 3-meter PUR screened cable with open wire ends
- ✓ Length 36.5 cm

At the request of various customers, we have changed the **design** of this probe. We have reduced the diameter from 14 mm to 8 mm. This resulted in a more sustainable product and a significant reduction of the production costs and list price (~ 30%), while the **performance characteristics** are still **top notch** (calibration accuracy of ± 5 mV, resolution of 1 mV).

Feel free to contact us at info@swapinstruments.com if you are interested in the new ORP-30-1-B.

Redox measurements in paddy soils in South Korea



The **company C&H** is our highly experienced and valued **distributor** in **South Korea** (www.candh.co.kr). They are specialized in environmental and agrological monitoring equipment.

Last summer and autumn, they supported a **scientific study** in which the **Redox potential** in **paddy soils** (rice fields) was measured with our soil Redox probes ([Redox probes – SWAP instruments](#)). When the paddy soil was dry, the Redox potential was approximately 600 mV. Upon flooding, the redox conditions underwent rapid and large changes: from oxic to anoxic conditions. During the anoxic conditions, methane was formed. Methane is a powerful greenhouse gas, with a Global Warming Potential more than 80 times greater than that of carbon dioxide ([Facts about Methane | UNEP - UN Environment Programme](#)). By controlling the water level in rice fields in a smart way, **methane emissions** can be **reduced** significantly. This can help **limit global warming**.

Feel free to contact us at info@swapinstruments.com for questions about our products and applications.

If you are interested in our products or if you would like to receive some additional information, please contact us at info@swapinstruments.com or visit our website www.swapinstruments.com.